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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/804,926 | 03/19/2004 | Kasra Khazeni | KLAP1679US | 8219 |
| 53537 | 7590 | 06/01/2006 | EXAMINER | |
| CAVEN & AGHEVLI LLC 9249 S. BROADWAY BLVD. UNIT 200-201 HIGHLANDS RANCH, CO 80129 | | | DETSCHER, MARISSA | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2877 | |

DATE MAILED: 06/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/804,926

Applicant(s)

KHAZENI ET AL.

Examiner

Marissa J. Detschel

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19 and 20 is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>8/13/04, 12/22/04</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

The information disclosure statements filed on August 13, 2004 and December 22, 2004, have been fully considered by the Examiner.

Claim Objections

The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

There is no claim numbered 14, and in view of this:

Misnumbered claims 15-21 have been renumbered 14-20.

Claim 13 is objected to because of the following informalities:

The very last two sections of claim 13, lines 9-13 read, respectively:

“a detection system configured to receive and detect light reflected from the substrate;

said detection system including quadrant photo-diodes to read information concerning the substrate from the substrate under evaluation including the directionality of scattered light.”

The detection system detects light reflected from the substrate. In view of this, the last 2 lines of the claim should read “the directionality of reflected light” as opposed

to "the directionality of scattered light" since the detection system receives light reflected and not scattered off the surface of the substrate.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 11 is rejected under 35 U.S.C. 102(a) as being anticipated by MacGibbon et al. (USPN 7,002,675).

MacGibbon discloses an elliptical cavity for the detection of surface scattered light (75) in a surface reflectance analyzer (Figure 10A), comprising a truncated elliptical cavity (66, Figure 10C) to be positioned with the surface under examination (16) substantially at one focal point of the cavity (F1) and a detector (68) at the other focal point of the cavity (F2), and mirror-like walls (66) internally along the inner surfaces of the cavity. (column 10, line 32 to column 11, line 15)

Claims 12 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Vurens (USPN 6,307,627).

Regarding claims 12 and 13, Vurens discloses an optical measuring system for evaluating a substrate, the system comprising

a laser (10) configured to generate an intensity stabilized light beam in a

wavelength of above about 400 nm (column 5, lines 54-56);

an optical system (110) for directing the beam to a particular spot on a substrate being evaluated (column 6, lines 11-17);

drive mechanism (80) to rotate the substrate (column 5, lines 13-15);

track and support structures to bring about relative motion of the light beam relative to the surface of the substrate as the substrate rotates (column 5, lines 47-51);

a detection system configured to receive and detect light reflected from the substrate;

said detection system including position sensitive photo-detectors, in the form of quadrant detectors, to read information concerning the substrate from the substrate under evaluation (column 18, lines 41-67).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-10 and 14-16 are rejected under 35 U.S.C. 103(a) as being obvious over Vurens (USPN 6,307,627) in view of MacGibbon et al. (USPN 7,002,675).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Regarding claims 1 and 9, Vurens discloses an optical measuring system for evaluating a substrate, the system comprising:

a laser (10) configured to generate an intensity stabilized light beam in a wavelength of above about 400 nm (column 5, lines 54-56);

an optical system (110) for directing the beam to a particular spot on a substrate being evaluated (column 6, lines 11-17);

drive mechanism (80) to rotate the substrate (column 5, lines 13-15);

track and support structures to bring about relative motion of the light beam relative to the surface of the substrate as the substrate rotates (column 5, lines 47-51);

a detection system configured to receive and detect light reflected from the substrate;

said detection system including polarizers to convert the reflected beam to s and p polarized light and detectors to read the information content of the s and p polarized reflected beams (column 14, line 61 to column 15, line 4); and,

an cavity (in the form of an integrating sphere) positioned adjacent to the point of impingement by the beam onto the substrate to capture the scattered light from the substrate and to detect the information incorporated into the detected scattered light to provide surface information of the substrate under evaluation. (column 10, lines 29-43)

Vurens does not disclose that the cavity has an elliptical shape. MacGibbon discloses the use of an ellipsoidal reflector to collect light scattered from a surface of a substrate in a scattered light reflector (column 10, line 32 to column 11, line 15). By using an ellipsoidal reflector, MacGibbon captures and redirects more of the scattered light from the surface, and the light passes only one time through the reflector to the detector surface. It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the elliptically shaped cavity of MacGibbon as the integrating sphere in the device of Vurens in order to capture and redirect more of the scattered

light, resulting in a higher signal to noise ratio in the detector, as a result, a more accurate measurement.

Regarding claims 2, 3, 7, and 8 a focal point (F1) of said elliptical cavity of MacGibbon is positioned substantially at the surface being examined (16) and a detector (68) is positioned substantially at a focal point (F2) of said elliptical cavity. (Figure 10A and 10C)

Regarding claims 4 and 10, the wavelength of the laser of the system as disclosed by Vurens is preferably changed between scans of the substrate by alternating between light sources. The advantage to this is that additional information can be obtained concerning the optical properties of the sample being measured. (column 11, lines 20-45) Therefore, the laser would be able to generate a stabilized wavelength of approximately 532 nm since Vurens device is capable of switching amongst various wavelengths.

In regards to claim 5, the detection system of Vurens includes a beam splitter (660) to split the reflected beam into two paths (666p and 666s) and to convert the second split beam into s and p polarized beams (column 14, line 61 to column 15, line 4).

Regarding claim 6, the elliptical cavity of MacGibbon has internal reflecting surfaces to effectively detect substantially all the scattered light of the optical measuring system entering the elliptical cavity (column 10, lines 61-67).

In regards to claims 14-16, the detection system of Vurens includes one or more position sensitive photo-detectors in the form of quadrant photodiodes (column 18, lines 41-67).

Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vurens (USPN 6,307,627) in view of MacGibbon et al. (USPN 7,002,675) as applied to claim 1 above, and further in view of Johs et al. (USPN 6,859,278).

It is understood that the rejection under 35 U.S.C. 103(a) as being unpatentable over Vurens (USPN 6,307,627) in view of MacGibbon et al. (USPN 7,002,675) as applied to claim 1 above incorporates some of the limitations of claim 17 and 18.

However, Vurens in view of MacGibbon does not disclose that compensators are used in the optical path of the system to compensate for unwanted phase shifts between the s and p beams introduced by other optical components. Johs discloses that when a ellipsometer system uses components that are located adjacent to each other and are stationary with respect to each other, the measurement that is detected is a composite signal illustrating measurements all the optical components and not just the desired surface reflection component. To compensate for this, a phase shift is introduced between orthogonal components of the polarized beam used in the measurement. (column 12, lines 34-51) It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the compensation technique of Johns in the apparatus of Vurens in view of MacGibbon in order to achieve the desired measurement of the reflected light off the surface of the sample being measured without stray

measurements due to the optical components, resulting in a more accurate measurement.

Allowable Subject Matter

Claims 19 and 20 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

As to claim 19, the prior art of record, taken alone or in combination, fails to disclose or render obvious the use of a quarterwave plate provided on a tilting plate that permits tilting of the plate with respect to a beam axis in an optical measuring system for evaluating a substrate, in combination with the rest of the limitations of claim 19.

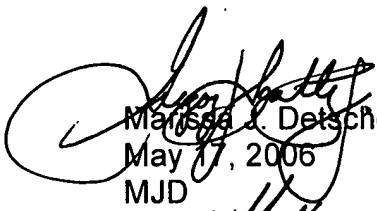
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marissa J. Detschel whose telephone number is 571-272-2716. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on 571-272-2059. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2877

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Marissa J. Detschel
May 17, 2006
MJD
24 May 06